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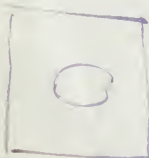
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C I R C U L A R

OF

T H E N A T I O N A L

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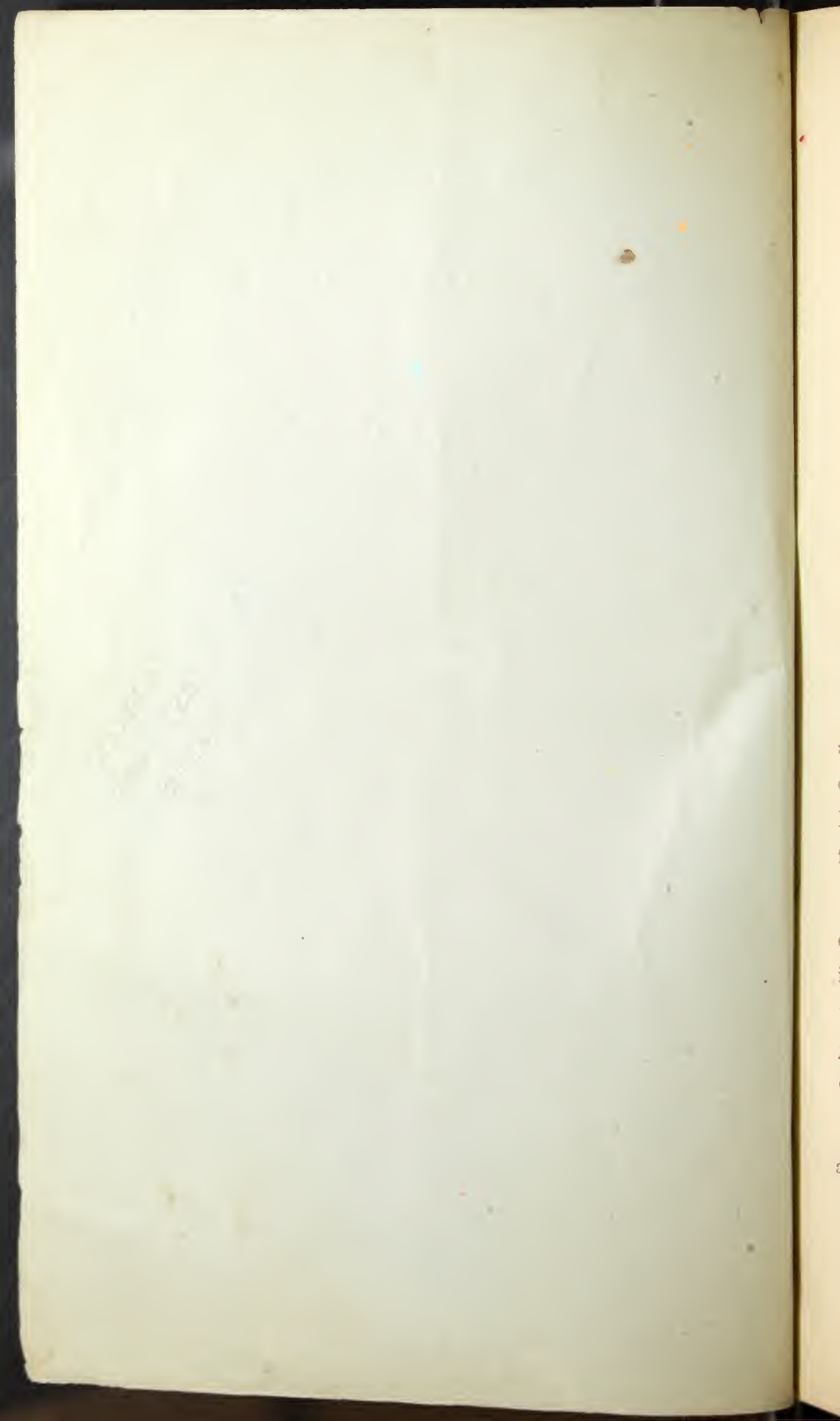
No. 237 Dock Street.

G. B. SMITH,

General Superintendent.

Woodferson

(C 1876)



IMPORTANT TO CONSUMERS OF LUMBER.

How can Lumber be Preserved?

Recent estimates by competent judges have revealed the alarming fact that the forests of this country are being stripped of timber at the rate of about *eight million acres per annum*. Hence the above question, "How can lumber be preserved?" is fast becoming very important.

Large consumers of lumber are year by year feeling the effects of such wholesale destruction of timber by the constantly increasing price which is being demanded for their supplies, which, to their minds, is a very convincing argument that some *practical* and *economical* method of preventing the destruction of lumber by *rot* would be immensely valuable.

The idea of preserving lumber is by no means *new*, and many and varied are the processes which have been employed for this

purpose, all of which have proved *failures* to a greater or less degree, either by being *ineffective* or so *expensive* as to render them impracticable for general use. It is well known that the decomposition or decay of the vegetable albumen, which all woods contain, is the cause of the destruction of the woody fiber. Hence, in order to preserve the structure of the wood, this albuminous matter must be reached by some chemical agent which will so change its nature as to render it indecomposable or insoluble, and thus prevent the natural disintegration of the wood. How to do this *effectually* and *cheaply* has been the great problem of the present age, which, fortunately, is now solved. The method which we employ to accomplish this result will commend itself as being *simple*, *inexpensive* and in *full harmony* with *nature's laws*. It is a well-known fact that the sap which affords sustenance to the tree is carried by natural forces from the root to the uppermost branches through the pores or channels which nature has provided. As two bodies cannot occupy the same space at the same time, it becomes necessary to expel the sap before any foreign substance can occupy its place in the wood, which is easily accomplished by the means employed.

Various and costly experiments have proved that lumber of ordinary dimensions cannot be thoroughly permeated with any antiseptic agent except through the natural sap channels. With this fact in view, we apply an antiseptic compound in solution directly to one end of a log, and, by the application of hydraulic pressure, compel it to enter the pores of the wood, by which

operation the sap is forced out at the opposite end. The necessary pressure is maintained by the use of an ordinary hydraulic pump until the sap is all expelled and the preserving solution appears in full strength, which is proof positive that the entire log is thoroughly impregnated.

Several important advantages are gained by this method, which are at once apparent. 1st. The timber, taken directly from the stump, is in its natural condition, the sap limpid and flowing, which by the means employed is easily forced out, thus allowing the preserving solution to occupy its place in the wood. 2d. The whole operation being performed in the open air, no costly cylinders or vats are required, and, being unlimited in space, *any number* of logs, of whatever dimensions, may be treated at the same time, and by the same power, thus materially reducing the cost. 3d. No steaming or heating of the wood being necessary, the expense attending such operation is saved, and the injurious effects of steam or heat on the lumber is not witnessed. 4th. The extreme simplicity of the operation renders the services of mechanical engineers or professional experts unnecessary. 5th. All parts of the apparatus are inexpensive, and, being portable, can be easily removed from place to place.

The preserving material which we prefer to use is known as "Clark's Solution," which is a compound of iron, zinc and mercury. As to its antiseptic properties, we refer you to the

several statements of well-known chemists relative thereto, which are herewith presented. Any other solution may be applied if desired.

Experience has sufficiently demonstrated that the various methods of treating lumber on the surface do little or no good, and in many cases only serve to accelerate decay. By some methods it is proposed to render the wood impervious to air or water, by the outward application of some substance which is intended to close or hermetically seal the pores. By such operation the natural sap or albumen is confined in the wood, and "dry rot" quickly ensues. By our method the outer and inner surface are subjected to the same treatment, and the entire stick is thus preserved.

Aside from the natural elements of decay, another very destructive agent is the marine animals which infest our harbors. Dock timbers, spiles, etc., may, by this method of treatment, be protected from their ravages, by being so thoroughly impregnated with poisonous substances as to render them obnoxious or destructive to insect life.

The Patents covering this method of treatment, and also the solution used, are owned by The National Timber Preserving Company, who will contract to furnish treated lumber of any dimensions, cut to order. They will also undertake to supply lumber dealers with "indestructible shingles," made from common woods, at a small cost, which will be more durable than

the best cedar now in use; furnish fence-posts which *will not decay*, either above or below ground; cross-ties and stringers for horse railroad use, which will last at least *five times* as long as those now in use; and any other preserved timber which may be wanted.

Works will be established at Williamsport, Pa., and at other lumber centres throughout the country, as circumstances may require.

The operation, on a small scale, may be witnessed at the office of the Company, 237 Dock Street, Philadelphia, where all communications should be addressed.

Views of well-known Chemists and others.

PROF. SILLIMAN, of Yale College, *Professor of Chemistry*, says:

"One of the ingredients alone is sufficient to preserve wood."

PROF. DICKINSON, of Hartford, Conn., in speaking of it, says:

"In view of the growing scarcity of lumber, I pronounce this one of the most important discoveries of the age."

BROWN'S UNIVERSITY LABORATORY,
Providence, R. I., March 25th, 1872.

G. B. SMITH.

SIR:—I have examined the specifications of Letters Patent

No. 94,869, and agree with the opinions expressed by Prof. Silliman,—viz., that “one of the ingredients alone is sufficient to preserve wood.”

Yours respectfully,

JOHN H. APPLETON,
Professor of Chemistry.

NO. 20 STATE STREET, BOSTON,
April 19th, 1872.

G. B. SMITH, Esq.

SIR:—I have examined the Letters Patent numbered 94,869, granted to E. W. Clark, covering a solution for preserving wood, and have to report as follows: All common woods contain the substance known as ALBUMEN, which decomposes rapidly, and by so doing it causes the decay of the woody structure (fibre) itself. Clark's solution when properly applied, so that it may follow the sap and thoroughly permeate each piece of wood or timber, unites with this albumen, and renders it almost *indecomposable*, thus *preventing decay* and preserving the structure of the wood.

The solution described in this patent contains antiseptic chemical agents, which are known to chemists as the best for this purpose.

Respectfully,

S. DANA HAYES,
State Assayer and Chemist,
Massachusetts.

Extract from Statement of PROF. F. A. GENTH, of the "Faculty of the University of Pennsylvania," Professor of Chemistry and Mineralogy.

UNIVERSITY OF PENNSYLVANIA,
West Philadelphia, Dec. 2d, 1872.

G. B. SMITH, ESQ.

DEAR SIR:—In compliance with your request, I have examined specimens of various kinds of lumber which have been treated in different ways with "Clark's Solution," for the purpose of preventing decomposition. This solution contains a small quantity of Chloride of Mercury (Corrosive Sublimate), together with Sulphates of Iron and Zinc. These ingredients, especially the first, are the *most powerful antiseptics*, and if properly applied *will prevent* the decay or rotting of wood. Many of the failures which have been experienced with so-called "Kyanized" or "Burnettized" woods are undoubtedly due, not to the ingredients used, but to the fact that the lumber was not thoroughly permeated by the chemicals applied.
These were fully saturated from circumference to centre; every particle of the wood contained the Mercury, Zinc, and Iron Salts applied.

I believe that, by the application of *hydraulic pressure alone*, lumber can be so fully permeated with this solution that it can be protected by the same.

The specimens which I have examined are the *only ones* which I ever *have seen* which had the antiseptic liquid forced into *every pore* of the wood.

Yours truly,

F. A. GENTH.

Extract from Letter of PROF. F. A. GENTH, dated

UNIVERSITY OF PENNSYLVANIA,

West Philadelphia, Nov. 24, 1874.

G. B. SMITH, Esq.

DEAR SIR:—Having recently witnessed the operation of your new method of applying antiseptic solutions to unmanufactured timber, I was very favorably impressed with the great simplicity of the apparatus, and highly pleased with the results obtained. . . . There can no longer be any question about the practicability of thoroughly permeating timber of any size or length. . . .

Yours truly,

F. A. GENTH.

OFFICE OF POWERS & WEIGHTMAN, Ninth and Parrish Sts.,

Philadelphia, May 14th, 1875.

G. B. SMITH, Esq.

SIR:—In reply to your inquiry relative to the possibility of preserving wood by impregnating the same with mineral salts, would say, that, in 1847, we saturated some hemlock posts with a solution of corrosive sublimate (chloride of mercury), and set them about our place; and a part of them are still standing, and in a *good state of preservation*. There is *no doubt* that the durability of wood is *greatly prolonged* by such treatment.

Respectfully yours,

POWERS & WEIGHTMAN,

Manufacturing Chemists.

Extract from a Letter addressed to MESSRS. POWERS & WEIGHTMAN, Philadelphia, under date Dec. 13th, 1847, relative to the Kyanizing process.

. In the summer of 1839 I prepared by this process about twenty-five hundred sleepers, which were placed under the rails of the Boston and Worcester Railroad in September of that year. They were principally hemlock, with some spruce, five inches square and seven feet long. I have recently examined them thoroughly, and have been unable to detect the slightest evidence of decay in any of them. The sap-wood which forms a part of some of them is in all instances as sound as on the day when they were laid. In one instance I noticed a piece of bark adhering to the sap-wood as closely and in as sound a state as it ever was.

(Signed)

WM. JACKSON.

[Mr. Jackson is well known in the Eastern States as a prominent and practical railroad man.]

PHILADELPHIA AND READING RAILROAD CO.

Philadelphia, April 12th, 1875.

G. B. SMITH, ESQ.

DEAR SIR:—I have examined your process of impregnating wood with a solution of sulphate of iron, sulphate of zinc, and a mercurial preparation, ingredients well known as antiseptics, and find the pores filled with your solution to the very heart of the tree.

As I consider this treatment beneficial to all woods exposed to the weather, I hereby ask whether you would be willing to

enter into a contract for the delivery of railroad ties, treated in the way stated.

Yours very truly,

M. LORENZ,

Civil Engineer.

OFFICE OF THE KEYSTONE BRIDGE Co., 218 S. Fourth St.

Philadelphia, May 15th, 1875.

G. B. SMITH, Esq.

DEAR SIR:—Having witnessed the operation of your method of impregnating timber with antiseptic compounds, I can very cheerfully say that it is not only extremely *simple*, but entirely *practical* and thoroughly *effective*, and I believe is the *only way* that timber can be successfully treated.

Very truly yours,

J. H. LINVILLE,

Civil Engineer.

[From the *New York Times*.]

Destruction of our Forests.

The constant and reckless destruction of our forests is fast bringing us to a condition in which there will be occasion for real alarm. It is not probable that any "scare" like that which a few years ago went over England, concerning the prospective exhaustion of her coal supply, will immediately occur in America, touching the loss of our forests; but we wish something near enough approaching it might happen to stop a work that is full of evil promise.

In the whole United States there is left but one really great tract of timber. It lies at the far extreme of our country, and consists of about one-half of Washington Territory and a third of Oregon. California has, perhaps, 500,000 acres of forest now, of which fully one-half has been cut away within the last two or three years. Here in New York we have no considerable forest left except in the Adirondack region. Our wealth of maple, walnut, and hickory is substantially gone, and a large part of it has been wantonly destroyed. Wisconsin had a magnificent forest growth, but the people are sweeping it away at a marvelously rapid rate. One billion feet of timber were cut in a single year. It will not take more than a decade or two at the utmost to fairly exhaust this source of wealth to the State. Michigan and Minnesota are following in the same course, slashing away at their forests as if a tree had no right to lift its head. One of our most intelligent Army officers, Gen. BRISBEN, who knows the Western country thoroughly, and to whose accurate knowledge of this subject we are indebted for many facts, says that 50,000 acres of Wisconsin timber are cut annually to supply the Kansas and Nebraska markets alone. The Saginaw forests are even now practically destroyed, and if the Northern Pacific Railway is built, it will open up to the axe the one remaining belt of American timber, in Oregon and Washington Territory.

The railroads have been the great destroyers of our forests. They use one hundred and sixty millions of ties annually—that means the leveling of at least 150,000 acres of trees. The timber they use, also, is not the refuse or the inferior, but among the very best, fine young trees, eight to ten inches in diameter. The Union Pacific Company undertook at first to lay their road with cotton-wood ties, drawn from the occasional wooded canons along the line of the road. One consequence of this was shown in our Washington dispatch the other day, regarding the legislation to be asked from Congress for the relief of the road. The Government Commission appointed to examine the line reported that it was not completed within the terms of the law. The use of these soft-wood ties was held by them to be an evasion of contract, and Government patents for the lands granted along two or three hundred miles of

the road have accordingly been refused. The settlers who have the lands can get no titles from the company, for it has none. This looks bad for our forests, since it means the ultimate destruction of thousands of acres of more good timber to replace the condemned ties which have already swept off a large part of the few precious growths of this comparatively treeless region. If it is remembered that ties have to be renewed every seven years, the extent of the demand on our forests will be appreciated. When 10,000 miles more of rails have been laid, it will require all the young trees in the country to supply the demand for trees.

Fences are also enormous consumers of trees. In the East we are learning in this regard economy from necessity, but in the West, in some States, the farmers cut down the forests with scarcely more thought than they harvest their grain. The fences of the United States, people may not generally know, have cost more than the lands, and are to-day the most valuable class of property, save railroads and real estate in cities. Illinois alone has \$2,000,000 invested in fences, and they cost annually \$175,000 for repairs. In Nebraska, where excellent herd laws are in force, the necessity for fences has been so much lessened that the fences of the State cost less in proportion to population than in any other in the Union.

The outrageous waste of timber caused by the felling of forests and burning of the trees to bring the land under cultivation goes on still at a fearful rate. From 1860 to 1870 no less than *twelve million acres* of forest were thus wantonly destroyed. For fuel also vast tracts are leveled of their trees. It took 10,000 acres of forest to supply Chicago with fuel in one year, 1871. Our annual decrease of forest from all these causes is not far from 8,000,000 acres. Yet we plant only 10,000 acres of new forest a year.

The necessity for a Commission of Forestry, and the need of efficient laws in all the States for the preservation of our forests, need no further argument than these facts.



